

PATENT APPLICATION
CR01-011AMENDMENTS TO THE CLAIMS

Enter
amend
SL 7/13/04

Please substitute the following claims for the respective claims previously existing in this application.

Claims 1. (Currently Amended) A field emission device including an anode and a cathode, said cathode comprising:
a substrate having a deformation temperature that is less than about six hundred and fifty degrees Celsius;

a nano-supported catalyst formed on said substrate, said nano-supported catalyst having active catalytic particles that are less than about five hundred nanometers in diameter, the nano-supported catalyst comprising:

a non-porous sub-layer, overlying the substrate, having said active catalytic particles and a structural metallic element; and

a porous sub-layer, overlying the non-porous sub-layer, having said active catalytic particles supported by a metal oxide structure; and

a plurality of nanotubes that are catalytically formed in situ on said nano-supported catalyst, each of said plurality of nanotubes having a diameter that is less than about twenty nanometers and configured to provide a switching voltage for triggering nanotube emission that is less than about eighty volts so that a nanotube emission current density drawn from said field emission device is greater than about one-half milliamperere per squared centimeter of said anode.

PATENT APPLICATION
CR01-011

Claims 2-3 (Cancelled).

4. (Previously Amended) The field emission device of Claim 1, wherein said plurality of nanotubes that are catalytically formed in situ on said nano-supported catalyst is catalytically formed in situ on said nano-supported catalyst with hot filament chemical vapor deposition (HFCVD).

5. (Previously Amended) The field emission device of Claim 1, wherein said switching voltage is less than about fifty volts.

6. (Previously Amended) The field emission device of Claim 1, wherein said active catalytic particles are less than about fifty nanometers in diameter.

7. (Original) The field emission device of Claim 1, wherein said diameter of said nanotube is less than about five nanometers.

8. (Previously Amended) The field emission device of Claim 1, wherein each of said nanotubes has an aspect ratio of greater than approximately one hundred and forty and less than approximately four thousand and five hundred.

PATENT APPLICATION
CR01-011

9. (Previously Amended) The field emission device of Claim 1, wherein each of said nanotubes are single-wall nanotubes.

10. (Currently Amended) The field emission device of Claim 1, wherein each of said nanotubes are multi-wall nanotubes ~~nanotube~~.

11. (Previously Amended) The field emission device of Claim 1, wherein said current density drawn from said field emission device is greater than about one and one-half milliamp per squared centimeter.

12. (Original) The field emission device of Claim 1, wherein said substrate comprises at least one material selected from the group consisting of borosilicate glass, sodalime glass, carbon, silicon, ceramics, metals, and composite materials.

13. (Original) The field emission device of Claim 1, wherein said field emission device is configured to provide a gate spacing of less than about twenty-five microns.

14. (Cancelled)

PATENT APPLICATION
CR01-011

15. (Previously Amended) The field emission device of Claim 1, wherein a second distance between said anode and said substrate is greater than about two hundred and fifty microns and less than about five thousand microns.

16. (Original) The field emission device of Claim 1, wherein a thickness of said nano-supported catalyst is less than one micron.

17. (Original) The field emission device of Claim 1, wherein said nano-supported catalyst is comprised of said active catalytic particles that are selected from the group consisting of iron, nickel, cobalt and a metal oxide selected from the group consisting of alumina, silica and magnesium oxide.

18. (Cancelled).

19. (Currently Amended) The field emission device of Claim 1 [[18]]. wherein said porous sub-layer has a surface area to volume ratio of greater than about fifty meter square per gram ($50 \text{ m}^2/\text{g}$).

Claims 20-40 (Cancelled)